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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,394	02/05/2002	Volker Harle	P1999,0003USN	8326

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Epping, Hermann & Fischer
Ridlerstrasse 55
Munich, D-80339
GERMANY

EXAMINER

MANDALA, VICTOR A

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/913,394

Applicant(s)

HARLE ET AL.

Examiner

Victor A Mandala Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 8-16 and 21-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Double Patenting

1. Claim 16 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 15. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent No. 10-242512 Katsunobu.

2. Referring to claim 1, an optical semiconductor device with a multiple quantum well structure, comprising: at least one combination of alternating well layers, (Figure 1 #6 & Figure 3), and barrier layers; (Figure 1 #6 & Figure 3), both further comprising various semiconductor layers, said well layers further comprising a first composition based on a nitride semiconductor material with a first electron energy, (Figure 1 #6 & Figure 3), said barrier layers further comprising a second composition of a nitride semiconductor material with electron energy, (Figure 1 #6 & Figure 3), which is higher in comparison with the first electron energy, and a

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radiation-active quantum well layer, (Figure 1 #13 & Figure 3 examiner's label #100), layered in direction of growth for which the well layers and barrier layers form a superlattice, (Japanese Patent Office Translation Paragraph 0024).

3. Referring to claim 2, an optical semiconductor device, wherein the well layers comprise thin aluminum-indium-gallium-nitride layers, (Japanese Patent Office Translation Paragraph 0024 Line 2), and the barrier layers comprise gallium-nitride or aluminum-gallium-nitride layers, (Japanese Patent Office Translation Paragraph 0024 Line 2), which are thicker than the well layers, (Japanese Patent Office Translation Paragraph 0062 Lines 2-3), and the radiation-active quantum well comprises an indium-gallium-nitride layer, (Japanese Patent Office Translation Paragraph 0042 Line 5).

4. Referring to claim 3, an optical semiconductor device, wherein the radiation-active quantum well follows an uppermost barrier layer, (Figure 1 #13 & Figure 3 Examiner's label #100).

5. Referring to claim 5, an optical semiconductor device, wherein the well layers are thinner than 2 nm and the barrier layers are at least 3 nm thick, (Japanese Patent Office Translation Paragraph 0062 Lines 2-3).

6. Referring to claim 17, an optical semiconductor device, wherein the radiation-active quantum well follows an uppermost barrier layer, (Figure 1 #13 & Figure 3 Examiner's label #100).

7. Referring to claim 19, an optical semiconductor device, wherein the well layers are thinner than 2 nm and the barrier layers are at least 3 nm thick, (Japanese Patent Office Translation Paragraph 0062 Lines 2-3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No. 10-242512 Katsunobu.

8. Referring to claim 4 and 18, an optical semiconductor device, wherein layer thickness of the radiation-active quantum well is greater than layer thickness of the well layers of the superlattice.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6, 7, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No. 10-242512 Katsunobu in view of U.S. Patent No. 5,684,309 McIntosh et al.

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9. Referring to claim 6, an optical semiconductor device, wherein the well layers and barrier layers are doped with silicon, (McIntosh et al. Col. 8 Lines 10-14).

Katsunobu teaches all of the claimed matter in claim 1 and 2, but does not teach the well and barrier layers to be doped with Si in a light emitting device, but McIntosh et al. does. It would have been obvious at the time the invention was made to dope the well and barrier layers with Si to make a pn or pin diode to one have skill in the art.

10. Referring to claim 7, an optical semiconductor device, wherein the dopant concentration is from 10^{17} to 10^{18} cm^{-3} .

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

11. Referring to claim 20, an optical semiconductor device, wherein the well layers and barrier layers are doped with silicon, (McIntosh et al. Col. 8 Lines 10-14).

Katsunobu teaches all of the claimed matter in claim 1 and 2, but does not teach the well and barrier layers to be doped with Si in a light emitting device, but McIntosh et al. does. It would have been obvious at the time the invention was made to dope the well and barrier layers with Si to make a pn or pin diode to one have skill in the art.

Allowable Subject Matter

12. Claims 8-15 and 21-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor A Mandala Jr. whose telephone number is (571) 272-1918. The examiner can normally be reached on Monday through Thursday from 8am till 6pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

VAMJ
3/17/04